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INC.

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H. KOPPERS COMPANY

Builder of

KOPPERS

BY-PRODUCT GAS OVENS

Ammonia Recovery Apparatus
Benzol Recovery Plants
Tar Distilling Plants

Consulting Engineers on the Operation of By-Product Coke and Gas Plants and Auxiliaries

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First National Bank Building, Pittsburgh, Pa.

THE AMERICAN
GAS LIGHT JOURNAL
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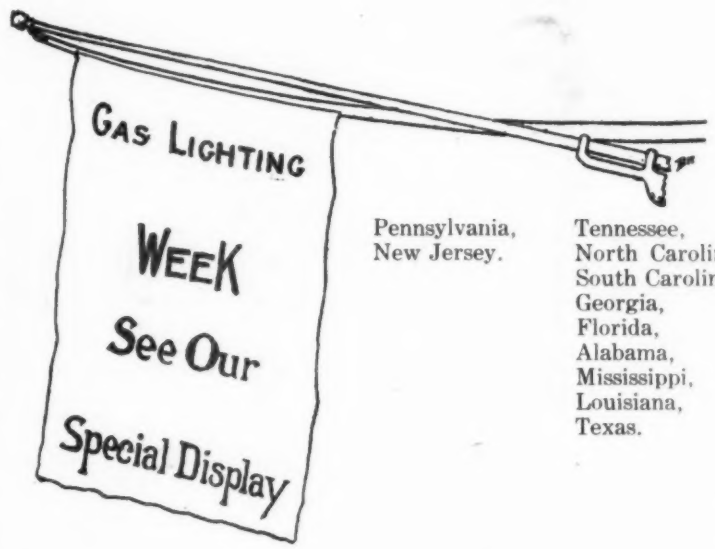
VOL. CIII., No. 10. NEW YORK, SEPTEMBER 6, 1915. WHOLE No. 2,100

NATIONAL GAS LIGHTING WEEK---SEPT. 27 TO OCT. 2, 1915.

Advance information that has come to the National Commercial Gas Association indicates that a large number of gas companies are planning to celebrate National Gas Lighting Week in a fitting manner. The N. C. G. A. stands sponser for this concentrated effort to place gas lighting before the public in a way that will make a favorable and lasting impression. It is expected that great benefits will accrue from the movement, and that, as a result of it, the way will be opened for greatly increased lighting business for all gas companies; but only by unanimous co-operation between determined individual companies can such results be obtained. Every company should tie up with the general plan. It may be modified, of course, by any special features that seem likely to help in securing the greatest local benefit; but the ideal of a common, intensified effort must be kept in the foreground.

Here is the opportunity for aggressive, united effort along a line that we all recognize as highly promising. Let us urge every company to take advantage of it. There should be active work in every part of the United States to make National Gas Lighting Week a Red Letter Week in the history of the industry.



Upon its completion, all companies are requested to send the N. C. G. A. a complete outline of the way in which they took up National Gas Lighting Week, including descriptions of all special attractions featured, copies of newspaper advertising and other forms of publicity.

The following suggestions appear in the September Bulletin, and will be helpful in preparing for the campaign. It is understood, of course, that they may need modification to suit various conditions:

Illumination of Show Windows and Display Rooms.—It is essential that your show winows, display rooms and offices be properly illuminated, and that the lights be kept burning every evening during the week. This is meant to cover both inside and outside lighting; and both should be as adequate and attractive as you can possibly make them.

Window and Show Room Displays.—Pay particular attention to your window and show-room display during and just previous to this week. Show windows are one of the most valuable means of bringing out the possibilities of gas, and during the campaign they should be used to the best possible advantage.

We also suggest that each company advertise its participation in lighting week, by placing in front of its main offices a large banner, appropriately lettered and designed. Undoubtedly such banners can be obtained from a local merchant or decorator.

$100 in Prizes for Window Displays.—The National Commercial Gas Association offers $100 in cash prizes to employees of gas companies for the best window display ideas used by a gas company during National Lighting week. These prizes will be:

Four first prizes of $15 each.
Four second prizes of $7.50 each.
Four third prizes of $2.50 each.

In order to insure an equitable distribution of the prizes, the States have been divided up into four groups, the intention being that one first prize, one second prize, and one third prize shall be awarded within each group.

1st Group.	2d Group.	3d Group.	4th Group.
Maine,	Delaware,	Michigan,	New Mexico,
New Hampshire,	Maryland,	Indiana,	Arizona,
Vermont,	Dist. of Colum.	Illinois,	California,
New York,	Virginia,	Missouri,	Nevada,
Massachusetts,	West Virginia,	Arkansas,	Utah,
Rhode Island,	Ohio,	Kansas,	Colorado,
Connecticut,	Kentucky,	Nebraska,	Wyoming,
		Iowa,	Montana,
		North Dakota,	Washington,
		South Dakota,	Oregon,
		Minnesota,	Idaho.
		Wisconsin,	
		Oklahoma.	
Pennsylvania,	Tennessee,		
New Jersey.	North Carolina,		
	South Carolina,		
	Georgia,		
	Florida,		
	Alabama,		
	Mississippi,		
	Louisiana,		
	Texas.		

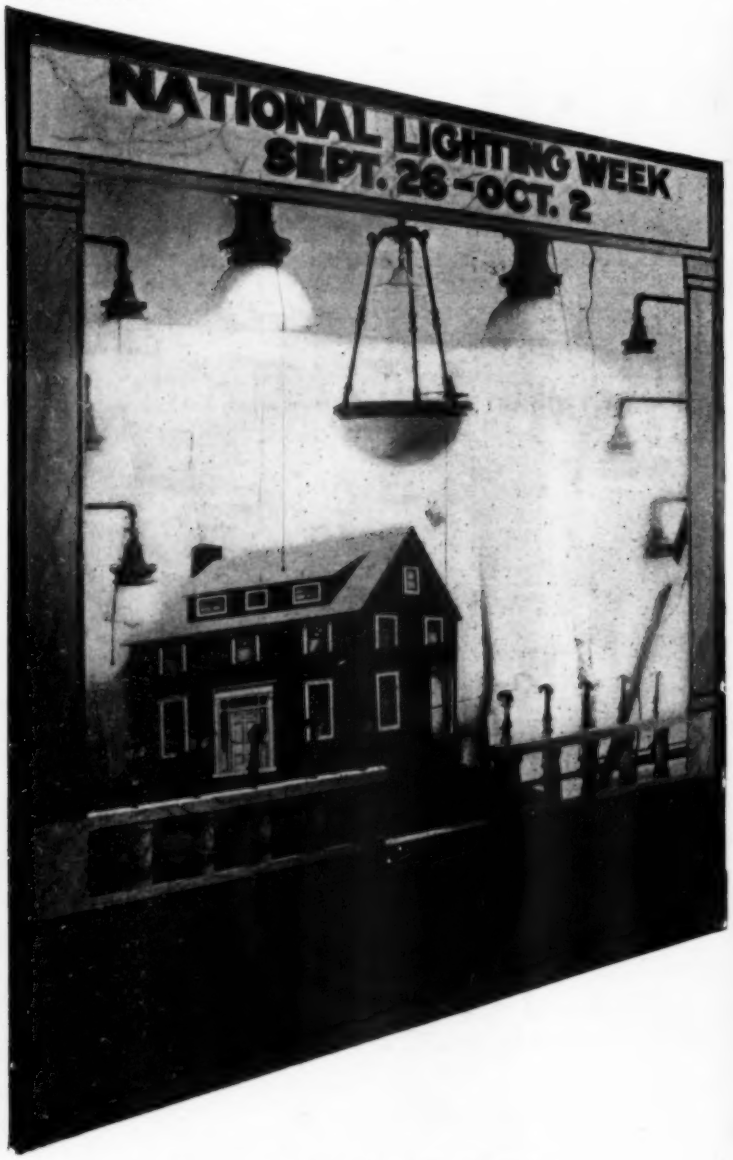
The employees will submit to their managers, plans prepared by themselves for window display for use by their company. The company will then select from these the plan they deem best, and prepare its window display during Lighting Week according to the plan. The latter will then be eligible for the N. C. G. A. contest, and should be sent by its designer to the National Commercial Gas Association, 61 Broadway, New York City, including a photograph and a detailed description.

Every gas company is urged to invite all its employees to enter this competition, as it is believed that many valuable suggestions can be obtained. All photographs and plans submitted in this competition become unreservedly the property of the National Commercial Gas Association.

The plans must be mailed to the Association between the dates October 2d and 15th. Remember: In order to be eligible for a prize, the plan must be designed by an employee of a gas company, and must have been used by that company during National Gas Lighting Week.

For the benefit of companies that do not enter this competition, we submit the following suggestion for a window display. It

is attractive and has the merit of being easily arranged, and costing but little.



Suggested Window Display, Lights Off.

This display will be used during Lighting Week by the Flatbush Gas Company, Brooklyn, N. Y.

It is a setting featuring various types of lighting units, and is made of cardboard, painted to resemble a granite front, and reinforced with wooden slats.

The display consists of three separate parts, but so matched that they can be placed together to resemble one complete setting. The parts are a frame, the house, and the grounds before the house.

Frame.—First in importance is the frame, built up of cardboard and reinforced with wooden slats, over all measurements being 96″ wide by 96″ high. The bottom panel is 19″ high, running the entire length of the front; the fence is 8″ wide, running from each end 31″, leaving a free space in the center of 34″; the top panel is 13″ wide and 96″ long. Side columns, 7″ wide, fill the space from top of fence to bottom of top panel.

The top panel is lettered "National Lighting Week," etc., in cut out letters; lights to be placed at the back so that words will stand out plain; the bottom panel to be used to explain the object of the lighting week.

Grounds.—Imitation grass ground, flat pieces of cardboad, 53″ long by 31″ wide; arrange small furniture and miniature plants to get effect.

The total cost of entire setting, with lighting effect (not including lighting units), should not be more than $15.

Fixtures and Display of Lamps.—On top of fence arrange a row of suitable small lamps to resemble street lights.

Side columns should have brackets to display small type gas units. Top panel can be used to hang larger lighting units.

House.—Any design of house with cut out doors and windows will do; it should be at least 30″ high by 50″ wide. Lights are to be placed behind it to show a well lighted home.

Suggested Window Display, Lights Burning.

Many devices for interesting their customers particularly in Lighting Week, will occur to the companies. One suggestion is a prize drawing contest, with one or more prizes in the shape of lighting appliances—semi-indirect fixtures, portable lamps, etc. Every visitor to the office would receive a card on which he writes his name and address, the cards being deposited in a ballot box. On the last day a number of them, equaling in number the prizes to be given, are to be drawn publicly, and the prize winners' names and the details of the contest will be published in the newspapers.

Reduction in Prices.—Another suggestion is that companies make a special reduction in the price of all lighting appliances sold during the week. Of course, proper publicity should be given to this, as to any plans adopted to stimulate interest.

Arousing Interest of High School Students.—It is suggested that each gas company manager arrange with the local Board of Education to have a high school competition in essays on gas lighting. The schools have been proved to be an excellent medium for advertising, since whatever arouses interest in the pupils will have a corresponding appeal for their parents. Of course, suitable prizes should be offered the competitors.

Evening Service—Increase in Sales Forces.—It is advisable for companies to have their offices not only lighted, but open, during the evenings of National Gas Lighting Week, and that the men of the organization should be on duty to answer questions and take care of business.

Companies that participated in Gas Range Week found it necessary to increase its regular force of salesmen to take care of the large extra volume of business. This is a good hint for Lighting Week. Companies should bear in mind the possibility of a need

for a larger selling organization on the sales floors, and be prepared to meet the demand.

Distribute the Home Equipment Booklet—The N. C. G. A. has on hand several thousand copies of "The Gas Equipment of the Home" booklets, which will be found a most attractive business-getting piece of literature to distribute just prior to and during the week. This booklet is replete with information and illustrations covering the use of gas appliances in the home, and includes many illustrations of good gas lighting, fixtures, etc. As some 80,000 copies have already been distributed by gas companies during the past year, resulting in a large number of good prospects and real business to them, we recommend that each company secure a supply and distribute them judiciously. The booklets are in two sizes, 8½" x 11" and 6" x 8", with cover of artistic design and color. Prices, f.o.b. New York City, are as follows:

	Large Size.	Small Size.
First 100 copies (each)	25 cents	10 cents
Next 900 copies (each)	20 "	8 "
In excess of first 1,000 (each)	15 "	7½ "

Using the Time Before Lighting Week.—It is suggested, finally, that companies prepare their plans sufficiently in advance of the week of September 27th, to give full publicity to the Campaign, and thus stimulate interest beforehand. This can be done through special notices, newspaper advertising, gas bill stickers, billboard advertisements, etc.

Newspaper Advertising.—The National Advertising Committee will send any gas company a portfolio of examples of appropriate newspaper copy, and in addition, will supply free, write-ups for newspapers, that will be acceptable to them as reading notices. We reproduce a few advertisements that gas companies might find useful; the name of the company to be inserted at the end of the copy.

You Must Know

the possibilities of

MODERN GAS-LIGHTING-HOW SCIENCE AND ART

have worked together

For the Most Harmonious Effects

There'll be a Week of Light on this Subject

NATIONAL GAS LIGHTING WEEK

(SEPTEMBER 27th–OCTOBER 4th)

The Gas Company

A Happy Combination

GAS gives you a dependable, eye-comforting light. Our modern appliances give you a beautiful, artistic effects.

You must see for yourself the latest developments in the lighting field——during

NATIONAL GAS LIGHTING WEEK

(September 27th–October 4th)

THE GAS COMPANY

Your Home

No matter how pleasing its decorative scheme it cannot appear at its best unless it is **artistically lighted.**

Do you know the beautiful effects possible with modern gas-lighting? Have you seen the wonderful new semi-indirect Bowls, the latest portables, Domes and Showers?

YOUR CHANCE TO GET IN TOUCH WITH ALL THAT'S

New and Best in Lighting

IS DURING

National Gas Lighting Week

(SEPTEMBER 27th–OCTOBER 4th)

THE GAS COMPANY

Alert Americans

pride themselves on their familiarity with the progress of their industries. In the great field of gas-lighting tremendous developments have taken place these past few years.

To familiarize the public with some of them—to put them in intimate touch with the amazingly beautiful effects that can be obtained from modern gas-lighting, we have set aside the week of September 27th-October 4th as

National Gas Lighting Week

THE GAS COMPANY

When You Use Good Gas Lighting

Just because you have grown so accustomed to dependable, eye-comforting gas-lighting, you may not be aware of the tremendous strides that have been made these past few years.

We're going to devote a week to showing you some of the most recent developments. Will you visit us during

National Gas Lighting Week
(September 27th-October 4th)

THE GAS COMPANY

That You May Know

more about the wonderful developments in modern gas-lighting we have set apart the week of

September 27th October 4th

as

NATIONAL GAS LIGHTING WEEK

THE GAS COMPANY

You are Modern

YOU LIVE IN A MODERN HOME. THAT'S WHY YOU MUST KNOW

Modern Lighting

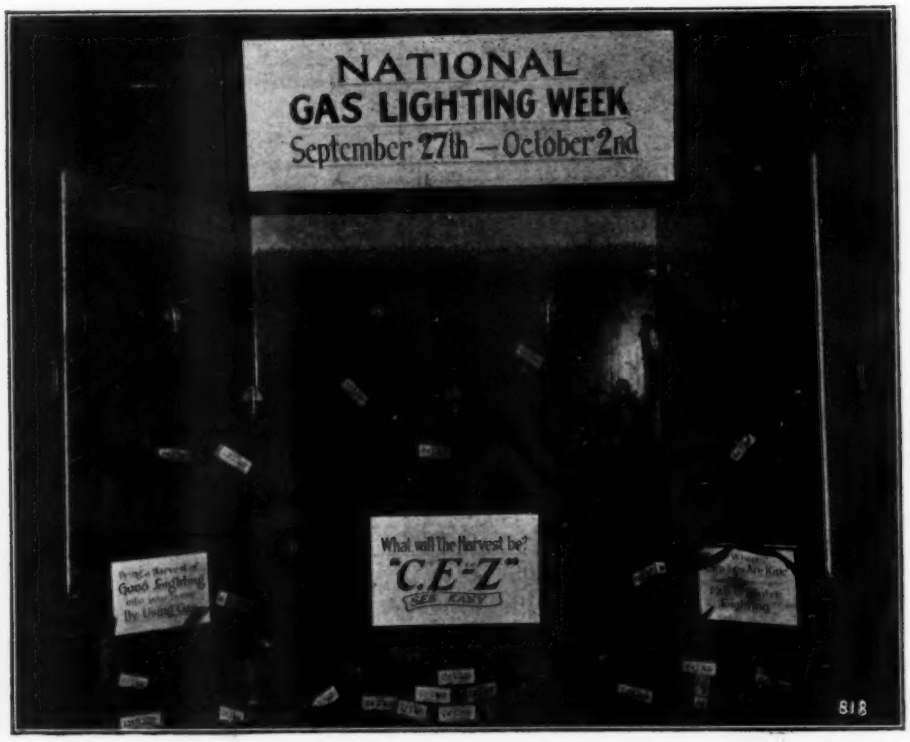
Are you in touch with the latest developments of gas-lighting? Do you know the artistic possibilities of the newest and best appliances?

If not, there is an especial interest for you in the coming

NATIONAL GAS LIGHTING WEEK

(September 27th–October 4th)

THE GAS COMPANY

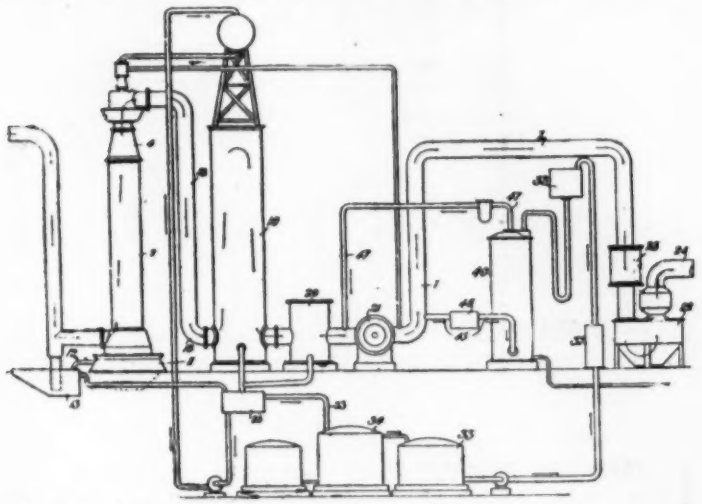


Above is a window setting suggestion from the United Gas Improvement Company, which that company intends using in Philadelphia. The three-panel background is painted to represent a corn field.

The floor can be covered with grass mats or earth, and six or seven uprights of small pipe, with lights on top, have corn leaves tied on to represent corn stalks. Boxed lights are tied on the stalks and distributed over the bottom.

Extracting Ammonia.

English patents have been issued to N. Schuster and British Coke Ovens, Limited, for a process of removing ammonia from coal gas, described as follows: The ammonia is extracted from ammoniacal liquor by means of a portion of the gas which the heavy hydrocarbons have been removed. For this purpose the necessary volume of gas for so extracting the ammonia is withdrawn from the main, is reheated, and, after having been passed through an ammonia still in which it becomes heavily laden with ammonia, is returned to the main under pressure, and, together with the gas flowing through the main, is caused to enter a saturator. As compared with the employment of steam for the extraction of ammonia from ammoniacal liquor, the process of ammoniacal liquor distillation as carried out by this invention effects an enormous saving of heat, chiefly latent heat. For instance, to heat 1 pound of water from



32° to 212° F., 180.79 heat units are required, and to turn the water into steam of the same temperature, *i. e.*, 212° F., an additional 965.7 heat units are required; but to heat up 1 pound of coal gas from 32° to 212° F., only 114 heat units are required. The gas for this process is heated to between 212° and 750° F., and if the stated minimum heat of gas is adopted, the ammoniacal liquor should be preheated to about boiling point. In substituting a given weight of steam required for the distillation of a given quantity of ammoniacal liquor at about 212° F. by an equal weight of gas at a temperature of 212° F., practically equal results are obtained with a considerably less expenditure of heat.

The crude gases from the coke ovens or gas producers pass through a pipe, 1, into the lower end of a tower, 2, in which they are subject to the action of scrubbing and cooling. A tar-receiving vessel, 11, is arranged at the lower end of the tower, 2, and is provided with an overflow pipe, 12, through which the accumulating tar passes into a pitch basin, 13. The gas then passes into a pipe, 18, communicating with the inlet end of a water-cooled condenser, 19, several of which may be employed in series. The gas which has been treated in the tower, 2, and has all the heavier tar constituents removed, after passing through the cendenser, 19, is drawn into a tar collector, 20, by means of an exhauster, 21. From the exhauster the gas is passed under pressure through the main, 7, into a saturator, 22, so the ammonia is deposited in the form of sulphate, the gas prior to entering the saturator passing through a cooler, 23. The gas leaves the saturator by a pipe, 24. The ammoniacal liquor which is produced by the process of cooling flows, together with tar, into the collector, 25, whence it flows through an overfllow pipe, 33, into a setting tank, 34, where it is separated from the tar, and overflows into a tank, 35, from which it is pumped through an economizer, 37, in which the liquor is preheated by passing through tubes subjected to the heat of waste gases prior to being forced into a feed tank, 38, the temperature of the ammoniacal liquor in the tank being, preferably, at about 230° F. From the tank, 38, the liquor flows into a still, 40, of usual form. Connected to the lower end of the still and below the lower-most partition therein, is a gas inlet pipe, 45, through which gas from the pressure main, 7, enters the interior of the still, 40, the gas during its passage from the pressure main to the still, passing through a heater, 46, where the heat of the gas is increased to a temperature not exceeding 750° F., and not below 212° F. The gas upon entering the still passes in an upward direction, and leaves the upper end through an outlet pipe, 47, connected to a part of the gas main in which the gas is at a lower pressure than at that part of the main to which the pipe, 45, is connected. Thus, in the arrangement shown, the outlet pipe, 47, from the still is connected to the suction side of the main connected to the exhauster, 21. In this way all the ammonia is passed in the vaporized condition with the gas through the saturator, 22.

The Advertising Influence of Employees.

[From a paper by F. R. SLATER, to the Southwestern Gas and Electric Association.]

In considering a subject of this nature, it would seem advisable to first determine just what is meant by advertising. The dictionary states that advertising is "publicity." This, in a measure, is a correct definition, but there is more than mere publicity in proper and effective advertising—something more comprehensive, more specific. Having this in mind, the proper definition is that advertising is "identification." Every employee of every business has a potential advertising value, by reason of the fact that every employee has a direct influence on the "identification" of the company for which he works. Particularly is this true of those who come in direct contact with the public they are endevoring to serve, and of those companies properly and commonly known as public service corporations—in other words, companies engaged in a business which by its nature is more or less a monopoly. The three best assets of a public utility are satisfied customers, a pleased public, and contented employees. The employees, from the highest to the lowest, have a direct influence in producing all three of these conditions, therefore their advertising value, or their value as a means of identifying the company, its aim and its aspiration, is very great.

Very few of us think of any business as a personal entity; although nearly always there is a human personality in it that influences us. This personality, or this influence of identification, may be the managing head of the concern, or more likely it is some of his assistants who come in more direct contact with us. The heads and executives we seldom, if ever, see; the visible part of the business is the local employees with whom we come in frequent contact. If these are courteous, and show consideration, and are inclined to observe the customer's rights, the business will gain good will and confidence and will thereby become "identified" as a desirable concern with which to do business. That employee, or group of employees, that can produce this condition of good-will and confidence is a valuable asset to the company and the very best advertisement it can have. If, on the other hand, the employee is discourteous and shows a lack of consideration, and does not observe the rights of the customer, dissatisfaction and faultfinding will result. This is the very worst possible advertising, because a great deal depends upon first impression. These impressions are formed in the public mind not only by the act and word of the employee, but largely by the manner in which the act or word is given. In other words, it depends largely upon the personality of the employee.

Personality is a large subject; you will be surprised to see the breadth of the definition of personality. It takes in everything—our clothing, our physical, mental and moral character, our smile and our frown, the money we spend, the money we throw away. None of us have a perfect personality. We fall down here and fall down there, but as long as we have the spirit to remedy our defects we are progressing. I heard a merchant speaking about a salesman say: "Now there is a man I can't like. He is bright and knows his business, but he leaves a bad impression every time he comes in. He is personally untidy and his language uncouth. I like his firm, I want to do business with them, but some day when I am not feeling just right, I may let my dislike for this salesman affect my dealing with the firm." This attitude on the part of the public or the consumer is very frequently exhibited to public service corporations. I have known many instances in which a consumer had very vigorous fault to find with the company, when, in fact, there was no particular fault on its part but the mannerism of an employee had impressed the customer unfavorably. The personality that wins is one that carries the conviction that the man himself is honest; that he has something to present that he understands and fully believes in; that his product is made in an honest manner and sold by honest men; that the company or business he represents are honest people; and, above all, he *must* leave the impression that he has come to give *service* and not merely "sell the goods" and leave it at that. When it comes to personality, faith is one of the greatest assets a man has, and also the greatest asset that his company has, for the personality of its employees is all there is for it to depend upon.

Another trait in human character that has a great deal to do with the personality of the employee is conscientiousness. This is the factor in a man's life having most to do with the development of what is beneath the surface—his character—and also—what is seen or known of him—his reputation. While conscientiousness is a determining factor, or one of them, in our estimate of an individual, so also is it a determining factor in our estimate of a business. The character of a business is generally formed by the character of the men or individuals going to make up that business; so that if the employee is conscientious, the impression that the public will have of the business is that it is conscientiously conducted, and the customer will always get "a square deal." Conscientiousness at the head of an organization permeates every part of it, entering into and securing high standards of conduct.

Much has been said about good will and what it is. In substance it is the reputation with the public for square dealing, which reputation is largely governed by the manner in which the company treats—not only its customers, but its employees; so that possibly one of the greatest advertising assets of any business is a contented lot of employees. More good can be done with the public through happy, contented employees than through most any other agency. Likewise, more adverse public criticism can be created by disgruntled employees than in most any other way. This is especially true in cases of personal injury. Humanitarian treatment of these cases will do more to make friends for the company than any other means. The treatment of such cases, whether of the employee or the public will go farther toward "identifying" the company than any other factor. In such cases, it is not infrequent that the whole tenor of public opinion can be traced directly to the way in which some accident case was handled.

It may happen, as it does not infrequently, that an employee is injured seriously. If the company gives the case the attention it warrants, if the needs of the family are taken care of, and all possible assistance is given to the injured, the advertising the company will receive is almost inestimable. Each employee, no matter how humble, has an influence in the community, and if this influence can be exerted, as it will be if accidents are handled in this manner, to publish the fact that he has received from the company just such treatment as one human being would render another under the circumstances, the company has received an advertising benefit, or has been advertised as being an institution to be copied in most particulars. Every employee, no matter what his position, is a salesman: First, the employee must sell his services to the company and then, directly in proportion as he is contented or satisfied in his employment, will he sell his company's services to the community, and on the manner in which those services are presented to the community by him will largely depend the favorable or unfavorable opinion and acts of that community with reference to the employer. "Advertising" of the wrong kind is a detriment, a loss, a liability that is cumulative in evil results. Advertising of the *right* kind—the favorable personal advertising by the employee, from president to office boy—is an asset that is cumulative of other assets that can be obtained in no other way.

In conclusion, I cannot do better than quote verbatim a pertinent editorial—from the *Journal of Electricity, Power and Gas*, of San Francisco—one that presents the matter in a novel and interesting manner. The editorial is headed, "Saving the Corporation Soul," and says:

"Humanizing the corporation, making it like unto man, implies that it is given the highest attributes of man. Man created the corporation in his own image—and rather a poor image it must have been about the time the corporation first came into existence. Since then man has become more civilized and his ideas as to right and wrong have improved. But the corporation has been allowed to develop along material lines only, and its spiritual nature has been stifled.

"Three hundred years ago an eminent English jurist, Judge Coke, declared that a corporation had no soul. Like many a legal precedent this false assertion was not questioned until recently. Soulless men made soulless corporations, and in 1819 the corporation was regarded merely as an 'artificial being, invisible, intangible, and existing only in the contemplation of the law," as defined by Chief Justice Marshall of the United States Supreme Court."

Here was an entity endowed with every human attribute and function except a conscience. Here was a man-monster, a veritable Frankenstein, a creature that threatened to destroy its creator.

"Finally some one discovered that it had a soul, badly neglected to be sure, but unquestionably a spirit connected with its material organization. Its character gave it a name, a purpose, a birthplace and perpetual existence. Its by-laws gave it memory and powers of discretion. Its *officials* and *employees* gave it a *soul*. Small souled men made little souled corporations, big souled men made large souled corporations.

"Aside from philosophical or religious speculation, a man's soul

is his sense of proportion concerning the rights of others, 'the faculty of seeing the whole in relation to the parts.' Likewise, the corporation soul, the composite soul of its directors and employees, is commensurate with its spirit of service. That corporation stands highest in public estimation which accords the best treatment to the public and its employees, while working in the interests of its owners.

"Recently, also, the courts have recognized the corporation soul by placing the responsibility for corporate acts upon corporate owners. They have gone behind the mask of this artificial personality, this legal fiction, and found that its acts were not automatic, but governed by human souls.

"The courts and commissions, however, have not yet realized that in order to develop the corporation soul it is first necessary to educate the individual soul. This form of regulation will be far more effective than all the artificial rulings to curb an artificial entity. Careful analysis of any organization will show that one man, or group of men, is the dynamo supplying the leading ideas and energy which runs it. 'An institution is but the lengthened shadow of a man.'

"Most corporations now realize that they have souls whose salvation depends upon their managers. Just as good properties are made by good men, and as the security of investments depend upon the character of the human entity behind them, so are the policy, ideals and conduct of the corporation controlled by the human souls that compose it.

"Managers should be teachers. In a big organization they cannot dot the work, but must teach others how to do it. Successful men must also be learners—learn more and earn more. To-day, the most important subject to be taught and learned by the corporation men who do seven-eights of the business of this country, is the extent and workings of the corporation soul. Emerson says: 'There is but one fixed and definite standard of life for each individual, that being the highest ideal of equity, justice and right, as determined by the soul attributes of the individual himself at any given time.' This conception of right and wrong is thus seen to be progressive and dependent upon the knowledge of the individual. The same definition applies to corporation life and corporation conscience. To humanize the corporation, to make it more human and more humane, it is necessary to teach it something about its soul—that it *has* a soul, that of its owners, its managers, its employees; and that as much as *they* manifest human and humane traits among themselves and towards their public, so much will that public reciprocate—and no more!"

Natural Gas Industry in the Appalachian Region.

The marketed production of natural gas in the States of New York, Pennsylvania, West Virginia, Ohio and Kentucky in 1914, amounted to 425,871,728 cubic feet, having a total value at the point of consumption of $73,677,641 or an average of 17.3 cents per 1,000 cubic feet. Compared with 1913 the output credited to these States shows a slight increase, 608,480 cubic feet, less than $\frac{2}{10}$ of 1%, whereas the value of the production shows a substantial gain, amounting to $4,359,537 or a 6% increase.

The accompanying table shows that the gain in output was chiefly in Ohio, although New York gained slightly, the increase in these States being more than sufficient to offset the decline in Pennsylvania, West Virginia and Kentucky.

The increase in value of output is due to the fact that relatively more gas was supplied to domestic consumers than to industrial consumers compared with previous years. Considering the region as a whole the increase in value amounted to an average of 1 cent for each 1,000 cubic feet marketed.

Quantity and Value of Natural Gas Produced in the Appalachian Region in 1913 and 1914.

State	1914.			1913.		
	Quantity in M. Cubic Feet.	Value. Total.	Cents per M	Quantity in M Cubic Feet.	Value. Total.	Cents per M.
New York	8,935,187	$2,600,352	29.10	8,515,257	$2,425,633	28.50
Pennsylvania	108,494,387	20,401,295	18.80	118,860,269	21,695,845	18.25
West Virginia	238,740,162	35,515,329	14.87	245,453,985	34,164,850	13.92
Ohio	68,270,174	14,667,790	21.48	50,612,211	10,521,930	20.79
Kentucky	1,431,818	492,875	34.52	1,821,526	509,846	27.99
Total	425,871,728	$73,677,641	17.30	425,263,248	$69,318,104	16.30

The quantity of gas consumed in the States considered, showed a slight decrease compared with 1913, indicating that a greater relative proportion of the output was piped, to other States. Less than one-half of West Virginia's great production is consumed within the State, the excess being piped to adjoining States and as far west as Indiana. Ohio consumed nearly three times as much gas as the State produced, whereas, New York consumed slightly more than double its own output. Pennsylvania supplied the discrepancy in New York, but imported several times that amount from West Virginia. Kentucky's requirements were five times its output, West Virginia being levied upon for the difference. The following table shows the consumption of natural gas in these States in 1914 and 1913.

State.	1914.			1913.		
	Quantity in M Cubic Feet.	Value. Total.	Cents per M.	Quantity in M Cubic Feet.	Value. Total.	Cents per M.
New York	18,401,830	$5,510,204	29.94	16,738,545	$4,888,412	29.20
Pennsylvania	164,834,542	28,439,324	17.25	177,463,230	28,709,565	16.18
West Virginia	95,147,247	7,334,690	7.70	96,645,438	7,333,956	7.59
Ohio	138,388,914	29,936,642	21.63	128,204,722	27,055,824	21.10
Kentucky	7,235,626	1,789,308	24.74	5,911,042	1,225,116	20.73
Total	424,008,159	$73,010,168	17.21	424,962,977	$69,212,873	16.28

Determination of Prussian Blue in Washer Sludge and Spent Oxide.

[An abstract translation in the "London Journal" of an account in "Zeitschrift für angewandte Chemie," of research made by DR. G. ANDERSON, of the Hanover works of the Imperial Continental Gas Association.]

The method of determining the cyanogen in cyanide water sludge, worked out by Dr. Bueb, used at the Residua Chemical Works, which deals with the sludge produced in Bueb washers in German gas works, is as follows: 50 grammes of the well-stirred sludge is boiled with 100 c.c. of a solution of caustic potash of 1.26 specific gravity, and about 200 c.c. of water, in order to get rid of ammonia. When cold, the whole is made up to 1010 c.c., 10 c.c. being allowed for insoluble matter. After agitation, the liquid is filtered through a dry filter; and to 25 c.c. of the filterate, 50 c.c. of water and 10 c.c. of dilute sulphuric acid (100 c.c. 1.84 acid made up to a litre) are added, and it is titrated with solution of sulphate of zinc, of which 1 c.c. corresponds with 0.01 gramme of potassium ferrocyanide, $K_4Fe(CN)_6 + 3H_2O$. The end point of the reaction is ascertained by the drop method, using filter paper and 1% solution of ferric chloride. A drop of ferric chloride solution and a drop of the liquid under test are placed on the paper, so that only their edges touch. The end point is, however, a subjective phenomenon, and is much affected by the method of lighting. Consequently differences of tenths per cent. making 10% of the total, readily occur with different analysis. The end point of the titration is affected by addition of sulphuric acid and by dilution; but errors arising from these causes can be offset by taking, in the standardization of the zinc sulphate solution, the quantities of acid and water that are prescribed for the titration of the cyanogen sludge. Sulphocyanide also is formed to some extent, from the sulphur present in spent oxide, when the liquid is boiled for 30 minutes. After 30 minutes' boiling, the ferrocyanide may be underestimated on this account by about 1%. The main disadvantage of the method is, however, the difficulty in recognizing the end point of the titration.

Knublauch's method of determining cyanogen has been shown to be inexact. A method commonly used is Drehschmidt's, which is as follows: 10 grammes of spent oxide is put in a half-litre flask, with about 150 c.c. of water and 1 gramme of ammonium sulphate. Then 15 grammes of mercuric oxide are added, and the whole boiled for about 15 minutes. After cooling, ½ c.c. to 1 c.c. of a solution of mercurous nitrate is added, with agitation, and ammonia until precipitation ceases. The contents are then made up to the mark on the flask, and 8 c.c. of water (or 1 c.c, for cyanogen sludge) is added to make up for the volume of solid material. From the filtrate, 200 c.c., which corresponds with 4 grammes of spent oxide, are transferred to a 400 c.c. flask; at least 6 c.c. of liquid ammonia of 91 specific gravity and 7 grammes of zinc dust are added, and, after repeating agitation, 2 c.c. of a 30% solution of caustic potash, and the contents of the flask made up to 400 c.c. After thorough agitation they are filtered through a dry double filter. Of the filtrate, 100 c.c. (corresponding with 1 gramme of the spent exide) are added to excess of decinormal silver solution in a 400 c.c. flask and acidfied with dilute nitric acid. After agitation and settling, the contents are made up to the mark, agitated and dry filtered. Of the filtrate, 200 c.c. are then titrated back with one-twentieth normal solution of ammonium thiocyanate, according to Volhard's process. The amount of the solution consumed corresponds directly to the excess of silver, and is deducted from the quantity of the latter used. Of decinormal silver solution, 1 c.c. corresponds with 0.002598 gramme of CN or 0.004771 gramme $Fe_4(CN)_{18}$.

The author investigated Drehschmidt's process on a solution of potassium ferrocyanide of known strength. Following his directions, the consumption of silver nitrate solution corresponded with 96.25% of the quanty theoretically required. In two other trials the liquid was boiled for 30 minutes (instead of the prescribed 15) and the results were 99.18 and 99.23% of the theoretical quantity. In subsequent trials 30 minutes boiling was therefore adopted. In order to ascertain whether the mercurous nitrate got rid of chlorine, which would effect the subsequent determination of cyanogen by titration, the author made a trial in which he added 0.1 gramme of sodium chloride. The chlorine was not completely taken up, even by an addition of 6 c.c. of mercurous nitrate solution. Three tests gave 125.7, 111.8 and 116% of the theoretical value.

In practice, such high results would not usually occur, as when the method is applied to cyanogen sludge it gives about the same results as other methods of determination. With Drehschmidt's method loss occurs through sulphocyanide formation. Two analyses, in which 1 gramme of sulphur was added to the potassium ferrocyanide solution, gave 94.94% and 96.88% of the theoretical value. The sulphocyanide unites with the mercurous salt, and is thus lost. Sludge from a cyanogen washer, tested according to Drehschmidt's method, with 30 minutes' boiling, showed in five successive determinations, 10.46, 10.19, 10.65, 10.35 and 10.56% of prussian blue. The mean of these figures—10.45%—agrees with the results found by the Feld-Witzeck method. The precautions necessary in the use of Drehschmidt's method are, therefore, that the boiling must be extended to 30 minutes, and the reagents must be free from chlorine.

The Feld-Witzeck method is as follows: Two grammes of spent oxide, or 0.5 gramme of washer sludge, are triturated for five minutes in a mortar with 1 c.c. of solution of ferrous sulphate (278 grammes per litre) and 5 c.c. of eight times normal solution of caustic soda (320 grammes per litre). Then there is slowly added, with constant stirring, 30 c.c. of three times normal solution of magnesium chloride; and the whole is washed into a 700 c.c. distillation flask with as much hot water as will bring the volume to about 200 c.c. After boiling for about five minutes, 100 c.c. of decinormal solution of mercuric chloride (27.1 grammes per litre) is poured into the boiling liquid, which is kept at the boil for ten minutes. The flask is then connected with a condenser, and 30 c.c. of four times normal sulphuric acid (392 grammes H_2SO_4 per litre) are run through a tap funnel passing through a rubber plug, and distillation kept up for 20 to 30 minutes. The distillate is collected in a conical breaker containing 20 c.c. of twice normal solution of caustic soda (80 grammes per litre); the flask being closed with a rubber plug with two holes, through one of which the delivery tube of the condenser passes while the other carries absorption bulbs charged with caustic soda solution to exclude air from the system. After the addition of 5 c.c. of one-fourth normal solution of potassium iodide (41.5 grammes per litre), the distillate is titrated; the end point being shown by a milky yellow cloudiness. One c.c. of decinormal solution of silver nitrate (17.0 grammes per litre) will represent 0.009548 gramme of prussian blue.

The author checked the accuracy of this method on a solution of known strength of potassium ferrocyanide, and obtained erratic results, always low. He found that cyanide of mercury was not completely decomposed by sulphuric acid alone, and that the presence of a large excess of soluble chloride was necessary to secure complete decomposition. He then made a number of tests on the solution of potassium ferrocyanide, using 50 c.c. of three times normal solution of magnesium chloride instead of the 30 c.c. prescribed by Witzeck, and obtained results very little below the theoretical values. It is to be observed that if the boiling with magnesium chloride is extended beyond five to ten minutes a loss ensues, and a low result is obtained. With pure ferrocyanide and washer sludge it is immaterial whether the material is treated with the eight times normal solution of caustic soda cold or hot; but with spent oxide cold treatment is preferable, as heat is liable to produce sulphocyanide.

A comparison of the three methods on a sample of washer sludge showed that the Feld-Witzeck method gave the highest and most consistent results; that Drehschmidt's method (which, moreover, requires costly reagents) gave very variable results; and that Bueb's method gave concordant, but rather low, results. The Feld-Witzeck method was, therefore, adopted in the Hanover gas works and the works by which its sludge is bought, and has worked satisfactorily.

About 20 grammes of sludge are weighed out exactly and then made up to 100 c.c. in a measuring flask, from which, after thorough agitation, 10 c.c. are taken and triturated for 5 minutes in a glass mortar with 1 c.c. of normal solution of ferrous sulphate and 5 c.c. of eight times normal solution of caustic soda. Then 50 c.c. of three times normal solution of magnesium chloride are added with constant stirring, and the whole is washed into a flask—the volume of liquid being brought to about 200 c.c. After boiling for 5 to 10 minutes, 100 c.c. of boiling decinormal solution of mercuric chloride are poured into the boiling liquid, and the boiling continued for ten minutes. The flask is then connected with the condenser, 30 c.c. of four times sulphuric acid are added, and the liquid is distilled for 20 to 30 minutes. The distillate is collected in 20 c.c. of twice normal solution of caustic soda. If it is cloudy, 0.5 gramme of lead carbonate is added to it in a measuring flask, which is filled to the mark, and an aliquot portion is taken for the titration, after the precipitate has been filtered off. The titration is carried out according to Liebig's method with decinormal solution of silver nitrate and the addition of 5 c.c. of one-fourth normal solution of potassium iodide. The appearance of a yellowish milky cloudiness indicates the end of the reaction.

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NEW YORK, MONDAY, SEPTEMBER 6, 1915.

Electric Heating Competition.

Two items in this issue bear on a form of competition that most gas men do not recognize as imminent. One refers to an installation of radient electric furnaces in a large automobile plant, where it is said the management was willing to pay $1,400 for electrical apparatus in competition with gas apparatus costing but $400, and notwithstanding the multiplied operating cost.

With the right kind of salesmanship, is there any good reason why gas cannot supplant solid fuel?

The other is a notice of the appointment of a heretofore prominent industrial gas expert to be engineer in charge of the electric-heating department of an important managing corporation.

As soon as they are real good, are they too good for the gas business?

The Dye Stuff Inquiry.

Dr. Thomas H. Norton, commercial agent for the U. S. Department of Commerce, has started an inquiry to determine the real situation in the matter of dye stuffs.

One of the first things to be done is a study of past imports of German-made colors in detail, to the end that the Government may know the kinds of colors and intermediates actually consumed in the textile and other industries of this country. The Government's import statistics fail to differentiate colors and classes of dyestuffs, lumping them under a general designation. The importers, of course, are in a position to supply this information, but it is understood that they are averse to opening their books for this purpose, alleging that to do so would be to reveal trade secrets which in some manner might become known to rivals. It is thought that with these data in convenient form, domestic manufacturers will be in position to know what is wanted, and then go ahead as far as possible with their manufacture.

To Limit Municipal Debt.

The Industrial News Bureau of Portland, Ore., says: "The tendency throughout the country is clear. The American people are inclined to plunge deeper and deeper into debt. This trait, made conspicuous from the report of the Census Bureau, is sure to be reflected in higher taxes. The quicker the people as a whole, come to realize what they are doing, the better for the present generation and for posterity.

"The Washington legislature has submitted a constitutional amendment to limit the debt and to limit the franchise at elections to those paying taxes.

"In Oregon, a law has been enacted limiting annual increase in tax levies to 6%, except by special vote of the people.

"A special bulletin of the U. S. Census Bureau shows that in 1913 the cities, villages, towns, townships, school districts, drainage, irrigation and levee districts, fire districts, poor districts, road districts, and all other minor divisions having power to incur debt, reported a net indebtedness of $3,475,954,353—an increase of $1,854,884,743 over the total for 1902. A small part of the increase, however, is doubtless due to a more complete canvas in the latter year."

Announcement, Canadian Gas Association.

The Eighth Annual Meeting of the Canadian Gas Association will be held in Montreal, Quebec, on Thursday and Friday, September 16th and 17th. Headquarters will be at the Windsor Hotel, where ample accommodations are available for all visitors.

The morning of the 16th will be given over to a business session, and the presentation of some very interesting papers that have been prepared for the occasion.

On the afternoon of the 16th there will be a trip to the new Lasalle Gas Works, which should be of special interest to all gas men, as the new plant has been pronounced by many engineers one of the most up-to-date on the continent. Preparations have been made for the entertainment of the ladies by a trip up the mountain and through the parks.

On the evening of the 16th, there will be a theatre party for the ladies, and a smoker for the men.

The morning of the 17th will be devoted to the presentation of papers and final business; and at the conclusion of the session, members, visitors and ladies will be taken to the Golf Club for luncheon.

The following are the papers that have been prepared:

"Carbonizing with Verticals in Ottawa," by A. A. Dion, General Superintendent, Ottawa Gas Company.

"Some Difficult Work in Large Pipe Laying Under Lachine Canal and Adjacent Swamp," by Chas. H. Osler, Superintendent Distribution Department, Montreal Light, Heat and Power Co.

"A Motor Driven Gas Pump Installation," by John S. Haug, Montreal Light, Heat and Power Company.

"The Value of Mechanical or Other Indicating or Recording Appliances in Connection with the Several Operations of a Gas Plant," by Wilfred Philpot, Chemist, Consumers Gas Company, Toronto.

"Routine of Billing and Receiving Department," by W. P. Baird, Manager West Division Billing and Receiving Department, Montreal Light, Heat and Power Company.

Michigan Gas Association Meeting.

The 24th annual meeting of the Michigan Gas Association will be held in Detroit on September 23 and 24. The members, and any other gas men that can make it convenient to attend, are urged to get to Detroit early on the evening of the 22d, as an entertainment is planned for that night, and only two days will be given to the sessions, instead of three.

The list of papers already arranged for is as follows:

"High Pressure Distribution for Small Plants," by Ralph B. Wagner.

"Recent Developments in the Doherty Washer-Cooler and Condenser Systems," by R. B. Rowley of the Semet-Solvay Company.

"House Maintenance of Gas Lighting," by Wm. O. Weeks,

"A Talk on Accident Prevention," by Chas. B. Scott.

"A Talk on the Welfare and Training of Employees," by C. L. Palmer of Detroit.

Then there will be a contribution from Professor Alfred H. White and his assistants at the University of Michigan, who are in charge of the experimental and research work carried on by the Michigan Gas Association through its Fellowships. This is always of value and interest to everybody in the gas business.

The banquet will probably be on the evening of the 23rd, and some unusually interesting speakers and other entertainment has been arranged.

Further details can be had from Glenn R. Chamberlain, Secretary, Grand Rapids, Mich.

PROGRAM, INTERNATIONAL GAS CONGRESS—SEPT. 27 TO OCT. 2.

Monday, September 27th,

8:30 A.M.—Directors meeting, Pacific Coast Gas Association.
10:00 A.M.—Annual meeting, Pacific Coast Gas Association.
3:00 P.M.—Directors meeting, American Gas Institute.

Tuesday, September 28th—Session 10 A.M.–1 P.M.

President's Address, Dr. Alex. C. Humphreys.
Secretary and Treasurer's Report.
"The Development of Water Gas," O. B. Evans.
"Deep Fuel Combustion as Applied in Water Gas Manufacture," Arthur G. Glasgow.
"The Substitution of Heating Value for Candlepower as a Standard for Gas Quality," R. S. McBride.
2 P.M. to 6 P.M.—Annual meeting of the American Gas Institute.

Wednesday, September 29th, 10 A.M.–1 P.M.

Section A.

Symposium on "Illumination," consisting of six papers, arranged by Mr. C. O. Bond:

"Introduction," C. O. Bond.
"Street Lighting," Geo. S. Barrows.
"Office and Store Lighting," O. H. Fogg and Thos. Scofield.
"Residence Lighting," W. A. Morris.
"Industrial Lighting," R. ff. Pierce.
"Semi-Public Lighting," T. J. Litle.
"Buoy and Car Lighting," George E. Hulse.

Section B.

Symposium "Commercial Aspects of the Gas Business," from the National Commercial Gas Association, under the direction of Mr. C. Willing Hare:

"Commercial Policies," C. Willing Hare.
"Public Relations," E. N. Wrightington.
"Office Management," C. N. Stannard.
"Complaint and Order Desk," W. J. Clark.
"Commercial Accounting," P. S. Young.
"Domestic Fuel Appliances," R. E. Slade.
"Domestic Lighting Appliances," J. D. Shattuck.
"Commercial Lighting Appliances," E. M. Colquhoun.
"Industrial Fuel Business," F. W. Frueauff.

Thursday, September 30th, 10 A. M.–1 P. M.

"Modern Coal Gas Processes," the Society of Gas Engineering of New York.

Symposium "A Review of the Present Practices in the Manufacture and Distribution of Gas by British Undertakings," a contribution from the Institution of Gas Engineers of Great Britain through the late Mr. Edward Allen, engineer of the Liverpool Gas Company, consisting of an introduction and five papers:

"Introduction," Edward Allen.
"Carbonization," John Bond.
"Condensation, Washing and Scrubbing," Dr. W. B. Davidson.
"Purification," J. Ferguson Bell.
"Distribution," Walter Hole.
"Sale of Gas," F. W. Goodenough.

PROGRAM OF ENTERTAINMENT.

Monday evening, September 27th, at 9 o'clock, the reception to the President of the International Gas Congress, Dr. Alexander C. Humphreys, of New York, takes place at the Palace Hotel. A ball and special features follow the reception.

Tuesday, September 28th, at 10 A.M., shopping trips to city stores and Chinatown for the ladies. In the afternoon they visit the exposition or other points of interest, as desired.

Tuesday night will be known as "Gas Night on the Zone." Delegates and their ladies will leave the Palace Hotel at 7:45 P.M. for the Van Ness entrance to the Zone. Transportation and admission to the grounds are arranged. This will be an especially pleasant evening, as many special features will be produced by the concessions.

Wednesday, September 29th, the ladies leave the Palace Hotel at 10 A.M., by automobile, for a trip through Golden Gate Park, with luncheon at the Cliff House; after luncheon, a motor trip through the Presidio to the Exposition.

Wednesday evening there is no set program, so that visitors will have an opportunity to follow their own bent.

Thursday, September 30th—Gas Congress Day. Visiting the Exposition, or shopping trips to Chinatown for the ladies during the morning. At 2. P.M., busses leave the Palace and St. Francis Hotels, going direct to the Scott Street entrance to the Exposition. Delegates and ladies march in body, headed by Exposition Band, to Festival Hall, where exercises will be held.

Mr. John A. Britton will deliver the address of welcome. There will be a presentation of a bronze medal to the International Gas Congress, by President C. C. Moore, of the Panama-Pacific International Exposition. Dr. Alex. C. Humphreys, President of the International Gas Congress, will respond. Mr. W. D'A. Ryan, Chief of Illumination of the Panama-Pacific International Exposition, has prepared a paper on "Illumination of the Panama-Pacific International Exposition," illustrated with colored lantern slides.

An organ recital is on the program for this afternoon.

The banquet room at the Inside Inn has been reserved for this night, where the delegates and ladies will dine informally at 6:30 P.M. At 9 P.M. there will be an informal dansant in the California Building. As a special concession, Commissioner W. D. Egilbert has arranged to have the Exhibit Department of the California Building open, so that all may see the wonderful products of the State.

On Friday afternoon, October 1st, one of the most delightful events of the week will take place at the Palace of Horticulture, "An Afternoon in Hawaii"; also a lecture on the "Art of the Exposition."

For the evening entertainment there will be special illumination and fireworks at the Exposition. Delegates and ladies will board special trains at the Fillmore street entrance, and Mr. W. D'A. Ryan will personally conduct the trip.

Saturday, October 2d, the last day of this interesting week, will be an appropriate finis—a trip on San Francisco Bay.

Up to the early part of August, the registration of those who will attend the Congress was not very encouraging, but great improvement has followed, and at this writing the prospects indicate a very satisfactory meeting, both in interest and attendance. For the benefit of those who are attending to details in San Francisco, it is important that registrations be made as promptly as possible. The attendance registration should be made with the Secretary G. G. Ramsdell, No. 29 West 39th street, New York city; train reservations with Mr. B. J. Kellum, Master of Transportation, 631 Washington Boulevard, Chicago, Ills., and the hotel reservations with Mr. Geo. C. Holberton, Chairman of Hotel Committee, 445 Sutter street, San Francisco, Cal.

It is hoped that the members of all the Gas Associations, and especially those in authority, will not fail to appreciate the fact that the financing of the Congress depends upon the sale of the Proceedings. The papers to be presented, together with the discussion thereon, will undoubtedly be of such interest that the printed proceedings should be in the hands of every gas man, and in the library of every gas company. One large company has given an order for twenty copies for its department heads, etc., an example that should be largely followed.

As there will be no funds available to carry a stock of the volumes for future sales, the subscriptions received will decide the size of the edition. The Proceedings, it is now estimated, will cover 600 to 800 pages liberally illustrated, a volume up-to-date gas literature.

Financing Public Utility Properties.

An address by MR. ANDREW COOKE. before the Wisconsin Gas Association.

In discussions among men engaged in the financing, construction and operation of public utility properties, a remark perhaps more frequently heard than any other, is that the "cream is off the public utility business;" and that there is at present time very little incentive for the development of new public service enterprises. Those who are most experienced, and who have the most at stake in the public utility field, are concerned at this time primarily in conserving the investments which they already have, and preventing partial confiscation of their properties by unfair valuations, unreasonable rate regulation and excessive taxation; and they are giving no thought to the development of new situations under the unfavorable legislative conditions with which they are now confronted,

So far as Wisconsin is concerned, when your public utility law was passed, it was generally regarded as an improvement in some respects over the laws which had previously existed, and the result of its operation was awaited with a great deal of interest. The commissioners appointed to carry out the law, were men of ability and of an impartial and judicial temperament—your corporations secured an indeterminate right to operate and protection against competition—and the public, through the powers given to the commission, secured absolute control over the rates charged, and the securities issued by the companies.

The law, however, has been far from a complete success from the standpoint either of the public or the corporations, as evidenced by the fact that your situation to-day is one of practical stagnation so far as the development of new public utility properties is concerned.

A public service commissioner in another State remarked recently, that he had often heard it said, and he himself was convinced that, under the limitations of your law and the ruling of your commission, it would not be possible, for example, to finance the construction of an interurban railway in Wisconsin, and that the same is true in New York, which has a similar law. This means that the public is not getting the service that it should receive, and it also means that your existing companies are receiving less than they should in property valuations and rates of return thereon, because they are not receiving as much as would be necessary in order to induce the investment of capital in new properties of a similar character.

In the old days, a group of men, with the necessary financial strength, could purchase a property in some city where the service was unsatisfactory and the business undeveloped, and then improve the equipment, extend and add to the plant, introduce more efficient methods of operation and probably also reduce the rates, and as a result so add to the volume of business, and so reduce the cost of producing the service, that the surplus earnings of the property applicable to dividends could be increased to a point which would show a substantial profit. The purchase of such a property would ordinarily be financed originally through an underwriting of bonds, preferred stock, or some other junior securities, and such an amount of common stock as might be necessary in order to make the underwriting attractive, and the profit to the underwriters would come from the dividends earned upon this common stock, or from the sale of this stock, which cost nothing in cash, but which would carry control of the property. But, under your present law, as I understand it, no such bonus common stock can be issued; and the value of a property in your State is fixed by your commission, not at what it originally costs, but at what, from a theoretical engineering viewpoint, it could be reproduced for, less a heavy charge for depreciation, all or a part of which the company should, in most cases, not be asked to stand, because the company has not earned enough in the past to provide for this depreciation—in other words, because the public, at the expense of the owners of the property, has been getting service at less than cost, depreciation considered.

Your commission having arrived at what it considers to be the present value of a certain property, fixes certain maximum rates for service which, in the opinion of the commission, will enable the company to earn what the commission believes to be a fair return upon its valuation of the property; but the owners of the stock of the company and the investors in its securities, have no guaranty that the return that the commission thinks reasonable will be earned.

Formerly the underwriters of a public utility situation were willing to assume the chance of loss in the purchase or construction of a property, because of the possibility of making a large profit; but under existing conditions, while there is still the same chance of loss, there is no chance of earning a profit that would be really attractive. There is no possibility of making money through the issuance of common stock, because that is forbidden, and your present law offers nothing as a substitute to induce the investment of money in new enterprises.

If your law is to prove successful in the long run, the legislature must pass such amendments as the commission shall from time to time find desirable—such, to cite a single example, as a provision for the issuance of stock without a par value; and your commission must modify its attitude on valuations and rates of return so far as may be necessary to encourage the investment of money; and the investors must be assured that the commission will be allowed to carry on its work free from political interference, and that just because certain cities are unable to secure gas, electricity or other public service at less than cost, the law will not be changed in such a way as to place your companies in a still more uncomfortable position than they are in at present.

The Illinois Legislature, believing that it would be good politics to pass a law giving a State Commission power to regulate rates and the issuance of public utility securities, recently adopted a law similar to yours, except that it does not afford corporations the protection of the indeterminite franchise feature of your law. The commission has absolutely no power to renew any existing franchises or grant any new ones that may be necessary in order to enable the companies to render proper service to the public, because the power to grant franchises remains in the local municipalities in Illinois; and, except in a case of a company that has a perpetual franchise, it is difficult to see how the Illinois Commission can work out a fair basis for the regulation of rates which does not permit a company to earn, if it can, an amount sufficient to yield the company a fair return on its investment, and establish a sinking fund that will return the principal of this investment to the bondholders and stockholders of the company at the expiration of its right to operate.

Another nearby State has a new law which is practically the same as yours, but the rulings of the commission there indicate such extreme hostility toward corporations, that I recently advised certain parties to discontinue negotiations which they had pending for the purchase of a large public utility property in that State. The attitute of this commission will probably drive investors away from the State in question, and when that is realized a sentiment will doubtless be created that will bring about a more friendly attitude toward corporations. That, however, is very small comfort to the man who has his money invested in existing public utilities there. All he can do in the meantime, is to make the best fight possible for fair treatment and against the confication of his property. He is pretty certain to sustain some irreparable loss, and if he loses money in one State he is not apt to be enthusiastic about investing additional money in a similar enterprise in some other State, even though he may be informed that conditions there are, at the moment, more favorable.

This reminds me of a story that I recently heard, of a carpenter in a small town in Nebraska. By the utmost economy on the part of himself and wife, he had been able to save enough money to go into the contracting business, and had finally accumulated about $20,000. He was induced by the president of a bank in his town to invest this money in the stock of the bank, and take a position as vice-president or cashier. Within 30 days the bank failed, and all his accumulated savings were wiped out. Someone remarked to this man's wife, that it must have been a terrible blow when they lost all the money they had in the world, and she replied: "Yes; but do you know, that $20,000 never did John and me any good, although we denied ourselves everything in order to save it. Now John is back working as a carpenter at $2.75 a day, and as soon as he gets his pay he hands it to me, and says: 'Here, Mary, take this and go spend it before someone gets it away from us.'" The point is, that this man, having lost his money by buying bank stock in his home town, is not going to make a similar investment in some other town later on.

You are all familiar with the recent flotation of preferred stocks of industrial companies, so many of which proved unsatisfactory. They looked safe, paid a high rate of interest, and were purchased in very large amounts here and abroad. Many investors sold bonds paying a lower rate of interest, and invested the proceeds in these 7% stocks. You know what happened in the case of several of these companies. The preferred stock of the Rumley Company, for instance, which was originally put out at close to $100 per share, is now quoted at nothing bid and $4.00 asked, and the company has just gone into the hands of a receiver.

Some such industrial stocks turned out all right, but because of

a few failures like that of the Rumley issue, it would be practically out of the question to float a new industrial preferred stock issue at the present time. The same situation arose as to irrigation securities, and after a few irrigation concerns had failed, all of the projects were discredited. Recently there have been defaults in a number of timber bond issues, and this affects the market for the good timber loans as well as the poor ones.

An earthquake and fire in San Francisco affects the whole country adversely—a financial stringency in Berlin affects not only London and Paris, but New York, Chicago and Milwaukee—so the problems facing the public utility corporations in other States are indirectly your problems; and it seems to be of the utmost importance for the public service corporations in this country, through State and national conventions and organizations, to start an effective and continuous campaign of education with a view to securing sane and uniform laws on all questions that affect public utility financing.

Take the question of what is a fair return upon a public utility property—or, as it should be stated, what return is necessary in order to make investment in public utility properties attractive. This question should be adequately and satisfactorily covered in every rate regulation inquiry, because, if upon the evidence submitted in one case the court or public utility commission decides that 7% is a reasonable return, such a decision is bound to influence other courts and commissions in deciding similar cases. You know, and I know, that money for the development of the public utility business cannot be raised if the return that is to cover interest on money invested, compensation for risks involved, and profit to the men who carry out the undertaking is fixed at that 7%, which various courts and commissions have stated is sufficient; but the necessity for permitting corporations to earn a higher return than this must be presented in a manner that will be convincing.

A member of a public utility commission in one of your neighboring States recently asked a witness in a rate regulation case, why an investment in a gas company operated as a protected monopoly in a growing city should not be considered as safe as a municipal bond of the same city, and why the gas company should be allowed to earn a higher rate than that paid on straight city indebtedness. Of course, one might expect such questions from an attorney representing the city that was asking for a reduction in the gas rate, but this was asked by a member of a commission that was acting as an arbitrator between the corporation and the public, and these and other similar questions which are actually asked or are in the minds of the courts and public service commissions, must be answered by you gentlemen in the public utility business, because no one else will answer them for you. It must be shown that even the first mortgage bonds of a gas company, for example, cannot be sold at anywhere near as low a rate as the municipal bonds of the city where the gas property is located; that the municipal bond is a charge on the property of the gas company ahead of all of its mortgage indebtedness; that the laws of our States relating to the investment of savings banks and trust funds, for instance, discriminate against public utility securities in favor of municipal bonds and real estate mortgages; that many other investment channels that are open to the sale of municipal bonds and mortgages, are absolutely closed to even first mortgage public securities; that only a part of the money invested in any property can be raised through the sale of first mortgage bonds; that a very high rate must be paid on junior securities and stocks issued to raise the balance of the money; and that, inasmuch as the cost of securing money is one of the principal elements in the cost of public utility service, it is to the interest of the public to place the corporations in as safe and secure a position as possible, in order that they may raise money at the lowest possible rates.

The truth is that we are all so much interested in our troubles, that we do not worry particularly about the troubles of others. As someone said, "there is a great deal of human nature in mankind," and we are inclined to look at every proposition from the standpoint of our own particular interest. If the city of Chicago can force the gas company there to sell gas at less than cost, the public will not set up nights to devise some means to raise the price of gas to a profitable point, and the gas consumers will not be likely to levy a voluntary assessment upon themselves to make up the loss to the stockholders of the company.

Take the recent fight of the railroads for an increase in rates: The manufacturers and other shippers and the traveling public did not worry because the earnings of the railroads were falling off, until it became evident that the difficulties of the railroads were seriously affecting the prosperity of the country. Then we saw a change in public sentiment, and an agitation in favor of an increase in rates by the Interstate Commerce Commission, so that the railroads may be put in a position where they can raise money for new tracks, additional terminal facilities and safer equipment, and give an impetus to general business by the purchase of materials and supplies. What is true of the railroad situation is true of the public utility situation, and the unsatisfactory laws which relate to the operation and financing of public service corporations will not be changed until such a time as the public believes that it is to its own interest to have the changes made.

Many of you are probably familiar with the street railway ordinances that were passed in Chicago in 1907, and which were adopted by the people by an overwhelming majority. For over ten years the surface transportation situation in Chicago had been going from bad to worse, and the public finally realized that in order to secure good service, it would be necessary to grant franchises under which the money for rehabilitation and new construction could be raised at reasonable rates, and that it was to the interest of the city to place every possible safe-guard around the bonds upon which this new money would be raised. Eighty or ninety million dollars of these bonds have been sold since 1907 to investors throughout the country, and one of the principal reasons why they found such ready sale is that instead of receiving a certain percentage of the gross earnings, as was originally proposed, the city receives a percentage of the surplus earnings which remain after providing for all operating expenses, depreciation and a return upon the valuation of the properties as fixed by the ordinances. If the city received a percentage of the gross earnings, its share would be payable before the bondholders receive their interest, but as it is, the bondholders know that the city will receive none of the profits from the operation of the roads until after the bondholders interest has been paid.

I talked recently with a man of very wide experience in public utility business, who at present is not interested in any properties. He said that he had considerable money himself; that he could easily secure a very large amount of additional money from his friends and acquaintances, provided he could find a situation which looked attractive; but that he had investigated one proposition after another during the last two or three years, and had not been able to find one in which he would care to invest his money, or that of his friends.

He said he knew of one or two places in the country where a man might perhaps go and make some money for a time, in the public utility business, without its being discovered; but that he felt it would not be long before the fact that he was making money would be found out, and a law would then be passed to prevent it. This man is very well informed, and he had wide experience, and if his view is correct, the present period of paralysis in the public utility field will continue for some time.

I suppose each one of you gentlemen has in mind some expenditures which should be made for extensions and additions of some existing public utility, or some new property which should be built, but the question is, how can the money be raised? You know that you could get the labor and the material if you had the money; you know where you would spend the money if you had it; but the fact is, that under existing legislative and financial conditions, the money is not to be had.

At the present time, when it comes to raising additional capital, most corporations are "between the devil and the deep blue sea." If a company, in order to sell securities, issues a circular placing a high valuation on its properties, the circular is very apt to be called to the attention of the tax authorities, and used as a basis for an increase in taxes which the company must pay. If the company charges into expense an amount sufficent to actually cover depreciation, its statement of earnings may be so unfavorable as to make it difficult for it to sell securities; and if it puts out an attractive statement of earnings, without any provision for depreciation, the municipality in which it operates will probably start a campaign for a reduction in what are apparently excessive earnings.

In financing a corporation, the great problem is, and always has been, that of raising the money to provide the equity over the amount of the first mortgage bonds of the company, which can be sold to provide only a part of the cost of the property. As compared with the task of selling junior securities and stock to provide the equity, the task of selling bonds is an easy one, because the owners of the equity are the first to suffer in case of loss. But the saleability of a public utility bond issue depends, to a very large extent, upon the ability of the company to finance the equity and provide the money to take care of the growth of the business. No banking house wants to injure its reputation and business by handling a bond issue of a company that defaults, even though

the security may be ample. The bondholders are usually scattered throughout the country; they do not want to take over the property and they are always frightened at the thought of a long drawn out receivership, foreclosure and re-organization. A bond house, bank or private investor, in considering the purchase of a first mortgage public utility bond, as well as the man who is considering the purchase of the junior securities or stock, wants to know that the company is in a strong position, that it has satisfactory franchise rights, that the territory served is a growing and prosperous one, that the earnings of the company are ample to cover all operating expenses, taxes, depreciation, interest and reasonable dividends on the stock, and that these earnings will not be decreased and the position of the company weakened by unjust taxation, unreasonably low property valuation and unfair reduction of rates by some regulating body.

I have endeavored thus far to state the problems facing public utility corporations as they existed before the commencement of the present European war, and, it goes without saying, that the financial difficulties of all corporations have been greatly increased by the tremendous wiping out of values that is taking place in Europe and which none of us can even comprehend. How far that conflict will extend, how long it will last, what its ultimate effect will be upon the financial situation in this country, how many million dollars of American securities now held abroad will be thrown back upon this country and at what prices, how much of the capital of the United States will be diverted to the development of new foreign commercial fields, or absorbed by the foreign loans which are being and will continue to be put out to finance the war, and after the close of the war to rebuild the countries involved, no one can anticipate because all of our old landmarks have been swept away. But so far as public utility corporations are concerned, there has been no constructive financing of any consequence for two or three years before the European war commenced. The large and strong companies had been borrowing money at high rates to meet their pressing obligations, but the smaller and weaker corporations had, in many cases, not been able to borrow money at all.

I have mentioned in a general way some of the reasons why this condition arose, and the need of sane and constructive public utility legislation; and in closing I simply wish to again suggest the advisability of creating a public sentiment that will enable you to secure such legislation, and of your putting your problems fairly and squarely before the people, remembering that it is surprising what can be accomplished if one tells the truth.

Industrial Uses of Gas at the Panama-Pacific International Exposition.

By JNO. B. REDD, Superintendent Collective Gas Exhibit.

Gas as an industrial factor is splendidly demonstrated at the Panama-Pacific International Exposition, and if you are interested and want to see a few of the uses to which this "best of fuels" is applied in a large number of exhibits, come with me into these beautiful palaces in which are displayed the wonderful handicraft of man.

First, we will visit the Palace of Manufactures, where the Gas Industry, as a whole, is represented by the Collective Gas Exhibit, which has been awarded a Grand Prize as the best lighted exhibit in the entire Exposition, and for the manner in which the goods are displayed.

Here you will find many gas appliances in actual operation, and demonstrated. The most modern and up-to-date gas stoves for hotels, restaurants and the home; thermostatically controlled automatic water heaters of the latest design, that furnish hot water by the mere opening of the water faucet; apparatus for generating steam, such as steam generators and gas boilers with electrically controlled temperature valves, for maintaining even temperature at any desired degree; gas radiators and hot air furnaces for heating buildings both large and small; many different designs of semi-indirect lighting fixtures; and gas arc lamps with distant control, both by by-pass valves and magnet valves. In this exhibit are also numerous appliances and apparatus pertaining to the manufacture and distribution of gas.

At other places in the Palace of Manufactures we find the latest style gas heated clothes pressing machines, which will do in a few moments the work that would ordinarily require several hours of the tailor's time; a few steps further, and you will find gas mangles for laundries and the home, that save much time in this usually tedious work. Displayed in one of the large electric exhibits is what is generally known as an electric washing machine, which depends, however, largely upon gas, as this fuel is used for boiling the water and keeping it at the desired temperature. The Palace of Varied Industries adjoins the Palace of Manufactures, and in this building gas is used in numerous exhibits. Entering the building from the Court of Mines, on the right, is a very interesting exhibit showing how silk is taken from the cocoons. The cocoons are placed in steaming hot water, which softens the textile and allows it to be spun without breaking, and as it is necessary to keep the water at a uniform temperature, gas is the fuel used. A few steps further, we see small gas blow-torches and soldering furnaces used in the manufacture of jewelry; and other gas appliances being used in connection with ceramic work. Neckties of many colors and delicate materials can be purchased in this building, and if you desire, the exhibitor will make one while you wait. Several gas appliances are used in connection with the manufacture of these goods.

We will now visit the Palace of Mines and Metallurgy; and one of the most interesting exhibits in this building is that of the United States Treasury Department, where you may see the efficient way in which coin making is done. Gas plays an important part in their manufacture; first for melting the metal, which is poured into ingots, rolled to the proper thickness, and the blanks cut out and sized. The blanks are then placed in a revolving, gas heated annealing furnace, and automatically dropped into a tempering vat. They are removed from this vat and placed in a revolving polishing receptical, and then into another revolving oven to be dried by gas heated air. After this process the blanks are ready for stamping.

Another interesting exhibit shows the manufacture of white lead, from melting of the pig lead in a gas furnace until the finished product is ready to be placed in packages.

In this building there are also a number of assayers, who show the methods used in their various lines of work, and in practically every instance where heat is required, gas fuel is used.

Before leaving this building, we will spend a few minutes listening to one of the finest pipe organs in the Exposition. In this room are a number of delicate musical instruments, and in order that these may be kept in good condition, is is necessary that the room remain at a uniform temperature; which is accomplished by using a gas heater.

Crossing the Avenue of Progress our steps lead to Machinery Hall, one of the largest exhibit palaces ever erected at any Exposition, and you wonder if it will be possible to comprehend the big maze of machinery and equipment which meets our gaze. Here you will find the most modern type of pyrometers and temperature controlled apparatus, operated in connection with gas heating appliances; also sanitary candy making machines, heated by gas. In the far corner of this wonderful building we find the press represented, and in connection with the many exhibits pertaining to newspaper work will be found gas heated metal melting furnaces, matrix driers, and many other gas heated machines of special types.

We now pass hurriedly through the remainder of the building, and I will let you see for yourself the numerous other exhibits where gas is used as fuel.

As it is past the lunch hour, we will go through the Court of Mines, Court of Abundance, Florentine Court, Court of the Universe, Venetian Court and the Court of the Four Seasons, into the Palace of Food Products, where our appetites may be stayed for the time being by samples of food, deliciously cooked in gas appliances. Upon entering this building, I will introduce you to a very pleasant young lady who will serve samples of our delicious California vintages, and I am sure, after this refreshing drink, you will be more in love with California and the Panama-Pacific International Exposition than ever.

I scarcely know where to commence showing you the gas appliances used in the exhibits in this Palace, as from almost any point I can point out several exhibits where gas is used in demonstrating. Large and small gas stoves, bake ovens, coffee urns, and specially designed cookers can be found throughout the building. Here is the Sperry Flour Company's exhibit, and the large bake ovens you see are heated by a blast gas burner. Three hundred 2-pound loaves of bread can be baked in this oven at one time, and that nice brown loaf is a sample of the work done by using gas for heating the oven and keeping it at a uniform temperature. At the Quaker Oats exhibit the bakers are busily engaged in preparing and baking hot scones, that are eagerly purchased by the hungry visitors; you will also find in this exhibit the famous "Food Shot from

Guns." The guns, or cylinders, are filled with grain, and placed in gas furnaces, and heated to the proper temperature to accomplish the desired results.

Their are many other gas appliances in the Food Products Building, as well as in other Exhibit Palaces not specially mentioned, but we have not sufficient time to-day to view all of these installations.

Before leaving you, however, I wish to call your attention to the fact that more than 12,000,000 cubic feet of gas per month is used inside the Exposition grounds, consumed, not only by the appliances you have seen, but by gas lamps used for lighting the Zone and the State and Foreign Section, and in the many cafes and restaurants where you are always sure of obtaining a nice meal.

Gas is used in many of the concessions on the zone. Near the Van Ness avenue is the "Yellowstone National Park," which is very interesting as well as instructive. Old Faithful Inn is reproduced, and is the largest cafe on the Exposition grounds. Gas is practically the only fuel for cooking and heating water here. The steam used in the reproduction of the guyser shown in the theatre of this concession, is genarated by automatically controlled gas boilers.

It is well towards evening now, and as I have mentioned at different times the wonderful lighting of the Exposition, I would suggest that we spend the evening on the grounds; and you will see how great a part gas lighting plays in the best illuminated Exposition in the history of the world. After you have viewed the gas lighting, and you have returned to your home to ponder over the wonderful sights you have seen, do not forget the importance of gas for industrial purposes, and the many ways in which it is applied in connection with exhibits at the Panama-Pacific International Exposition.

Correspondence.

The JOURNAL is not responsible for the opinions expressed by correspondents.

A Correction.

GLOUCESTER, N. J., August 4th, 1915.

Editor, AMERICAN GAS LIGHT JOURNAL: DEAR SIR—In the printing of my article on "The Composition of Gas In Relation to the Performance of the Incandescent Burner," I notice some errors in the arrangement of the mathematical equations toward the end of the article. This is probably due to the difficulty of setting up such matter with the type ordinarily available.

I am sending herewith a correct arrangement of these equations, and if you consider it desirable you may make a cut of this and publish with appropriate explanation.

$$I_{av} = \frac{\int_{2100}^{3000} \left[-0.000018H^2+0.092H\right]dH}{3000-2100}$$

$$\left\| \begin{matrix} H=2100 \\ H=3000 \end{matrix} \right.$$

$$= \frac{-0.00006H^3+0.046H^2}{900} \left[\begin{matrix} H=2100 \\ H=3000 \end{matrix} \right.$$

$$= \frac{104706}{900} = 116.34$$

I also notice an error of my own which should be corrected. Throughout the article, humidity, wherever mentioned, should be stated as in grains per cu. ft. instead of metres per cubic centimetre. The change to the latter unit was made after these tests were completed, and bv an oversight the necessary correction factor was not applied in working up the results of the test. The correction factor is approximately 3, which makes the humidity factor 9, instead of 2.716. This does not in the least affect any of the subsequent calculations, as the humidity correction factor is divided by 3 while the figures for humidity are multiplied by 3. You will note that this factor for the correction of humidity agrees rather closely with that obtained by Mr. Bond but is somewhat higher.

Very truly yours,

R. ff. PIERCE,

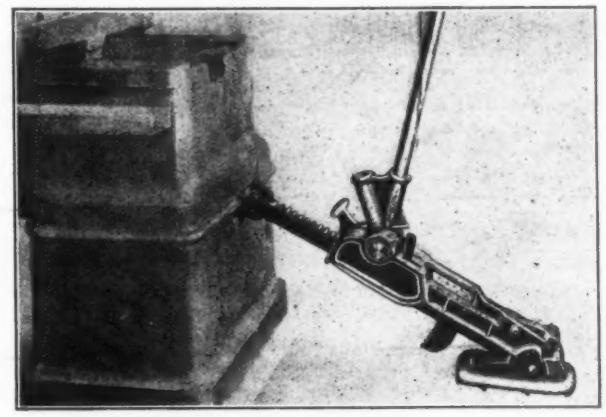
Manager Illuminating Engineering Laboratories.

P.S.—Formula $D=\frac{H}{I}= -0.00008H+0.092$

Should be $= -0.000018H+0.092$.

New Methods and Appliances.

AN ADJUSTABLE LIFTING AND PUSHING JACK.—A jack with an adjustable base has recently been put out for use where pushing or lifting, or both, are required. As shown, the frame is a heavy



ribbed malleable-iron casting. The base is broad and toothed on the under side. The frame bears on the base through two-faced circular shoulders, and the pin carries no load. The rack bar and cap are forgings.

TESTS OF FIREPROOFED WOOD.—At a recent meeting of the National Fire Protection Association, the Committee on the Uses of Wood in Building Construction presented an extended report dealing with tests of wood treated with various fire-retarding compounds, made at the Government Forest Products Laboratory in Madison, Wis. The tests were under the direction of Robert E. Prince, and included tests of the relative inflammability of various species of wood untreated, and of various paints claimed by their manufacturers to have a fire-retardent effect.

The conclusions arrived at may be briefly summarized as follows: The widely held idea that certain kinds of lumber are much more resistant to fire than others, was not supported by the tests. It should be said, however, that tests were made on the soft woods such as are in general use for building construction. Of course, the hard woods are less easily ignited than the woods from most evergreen species, but this is not a fact of practical importance, since the hard woods are generally unsuitable for exterior use.

The tests on lumber fireproofed with various chemicals, showed that some of them decreased the strength of the wood or discolored it, and had a corrosive effect on the cylinders used for treating. The best results in fire retardation were obtained from wood treated with ammonium salts and sodium borate. These chemicals are obtainable at prices that are not a serious handicap to the use of wood treated with them. The fire-retardant paint tests showed that a number of the paints have considerable value in decreasing inflammability, especially those designed for interior use. Extended tests were made with various methods for reducing the inflammability of shingle roofs, and it was found to be practicable to effect this by various methods at a reasonable cost.

ELECTRIC FURNACES FOR HEAT-TREATMENT.—Recent developments in electric-furnace work, made by the manufacturers in bringing out a type of furnace somewhat resembling in principle the operation of the Nernst lamp, give promise of better furnace durability.

In these new furnaces the floor and the dome-like cover are of a refractory material that is practically non-conducting at ordinary temperatures. The furnace is started by passing a current through a path of coke laid on its floor, which then heats up and becomes a conductor. In turn, the floor heats the walls and top, rendering them conducting, so that when finally in operation the entire furnace becomes an incandescent resistor.

As already intimated, this new type of furnace is believed to promise great results. Automobile manufacturers, and other users of heated steel, seem willing to incur almost any expense to get the uniform dependable heat they require. One manufacturer, for example, cheerfully paid $1,600 for an electric furnace, although an equivalent gas-heated one was offered him for $400.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

THE modesty of Paul E. Mitchell, chief clerk of the Brooklyn branch of the Brooklyn (N. Y.) Union Gas Company, delayed a story in which he played the hero. On the morning of Wednesday, August 18, Mitchell dived overboard, at Henry Keerner's Fishing Station, on the Old Mill Creek, and after diving twice, brought up a girl who had fallen overboard. The girl was about 10 years old, and was playing on the float at the station when she happened to slip off the float into deep water. She was being carried beneath the float by the tide, when Mitchell ran up and plunged in without hesitation.

THE Providence (R. I.) Gas Company is installing a high pressure exhauster plant, the work being done by The Gas Machinery Co., of Cleveland, O.

Mr. J. J. MURRAY, who for some years has been Superintendent of the Allegheny Heating Co., Pittsburgh, Pa., has been promoted to City Superintendent for the Philadelphia Co., effective Sept. 1st, 1915.

WHEN the Rochester (N. Y.) Railway and Light Company has effected all of the changes incidental to introducing a continuous-billing system, including the reading of meters successively during the month in the 22 districts into which the city has been divided, its bookkeeping system will have been revised. Under the new system, the gas and electric meter "reads" in each district are permanently routed, and after having been filled in by the meter reader, the route books are transmitted to the billing clerks whose duty it is to prepare the bills on a combination gas, electric and appliance form. The billing clerks forward the bills to the debit posters for entry in the combination customers' ledger. Besides combining the gas, electric and appliance accounts in one ledger, the combination bill will enable the company to work out statistical classifications on the Hollerith tabulating machine in one operation. Before long the company expects also to eliminate meter readings from the ledgers, and depend on the meter route books for this record.

MR. HENRY O. LOEBELL has been appointed engineer in charge of the new electric-heating department of the H. L. Doherty organization, the headquarters of which will be at Toledo, O., where Mr. Loebell recently supervised the installation of the initial equipment for the 15 kw. heating load of the Willys-Overland Automobile Company. The work of the new department will consist in the study and development of new opportunities for industrial electric heating business.

THE Sea Cliff and Glen Cove (N.Y.) Gas Company has satisfied the complaint made to the Public Service Commission, Second District, by the Glen Cove Board of Fire Commissioners, as to lack of shut-offs on service pipes. Following a thorough investigation by the commission's experts, the complainant has informed the commission that the complaint has been satisfied and the case has been closed.

THE Bridgeton (N. J.) Gas Light Company has acquired the Minch coal yard property, with its 100 feet of wharf frontage. It plans to use the space for coal storage, besides utilizing the remodeled building for stable and storage purposes. Provision will also be made for an industrial fuel demonstrating plant, and for dining-room accommodations for employees, besides a room for class meetings, etc. The purchase of the Minch property gives the company all the property on the west side of Water street, south of Newell's lane, including the site of the new holder below Vine street, with the exception of two lots. The Bridgeton Gas Light Company's business is increasing and it is one of the most important utility concerns in South Jersey. The excellent service, the exceptional liberal policy and the splendid management of the company have made it one of the most successful in the State.

No change in the firm of Humphreys and Miller, Inc., has been announced, although Alten S. Miller has joined the management of the Bartlett Hayward Company, and moved to Baltimore. This move was like returning home, as Mr. Miller was at one time associated with the Consolidated Gas, Electric Light and Power Company, and has many friends there.

APPLICATION has been made by the Syracuse (N. Y.) Lighting Company for a building permit for the erection of another gas holder near its plant on Mechanic street. This one will be the largest in the cluster of storage tanks about the plant, its cost being given at about $100,000.

BY the purchase of an acre and a half of land at the corner of Bay and Birch streets, the Fall River (Mass.) Gas Works Company has filled out its ownership of the block bounded by Bay, Birch and Charles streets and the New Haven railroad, excepting only a small lot at the corner of Charles and Bay streets. The block is that containing the company's new generating plant, and extends on the other side of the railroad tracks to the company's wharf property.

COMMISSIONER MCCARTHY, of Richmond, Va., does not believe that the city should advertise that it sells gas. The Directory Company sent a communication to the Board, asking them to renew the advertisement in the City Directory, calling attention to the city gas company. Commissioner McCarthy said, when the clerk read the letter, "I do not see the use of the city advertising that we sell gas; everyone knows it. I move, Mr. President, that the communication be placed on file." The board passed the resolution.

THE Brockton (Mass.) Gas Light Company has reached Stoughton, on Pleasant street, in laying the gas mains for that village.

THE Milford (Mass.) Gas Light Company, in reply to a request from the town committee appointed to take up the matter of purchasing the company's plant, put a value of $196,296.44 on its plant and franchise. It is said that the last reported liabilities of the company totalled $110,000.

WILLIAM J. HAGENAH, who was connected with the public utilities commission of Wisconsin for some time, and who has had extensive experience in handling cases similar to that confronting Dayton, O., in connection with the natural gas contract, will investigate the situation for that city. The company has employed Edward G. Pratt, of Chicago, who is also recognized nationally as an authority on gas production and supply. These two distinguished specialists will make separate investigations and prepare statements incorporating their discoveries or conclusions for the benefit of the State commission.

CLAIMING that the $1 gas rate, as sustained by Judge B. F. Bledsoe, after a long court battle, is too low, the Southern California Gas Company has made application to the State railroad commission for an appraisal of its property and the fixing of a rate to cover all its properties in Los Angeles, Riverside and San Bernardino counties. In the application, the company sets forth that in the year ending June 30, 1915, it received from the San Bernardino and Riverside districts a gross revenue of $165,527.53, while its total operating expenses, including taxes, were $100,682.14; that depreciation for this period in the district was $24,000, and that there was left for net return during the year, not over $41,000, which is claimed to be a fair return on a property valued at not over $512,500, whereas the fair value of the property actually and necessarily employed in the service is not less than $800,000.

CHARGING that the Consumers' Light Company of Plymouth, Newport and Hanover Townships, Pa., deliberately closed its plant to the benefit of the Luzerne County Gas and Electric Company, a suit in equity has been started against Judge John M. Garman, John W. Schreiner, Charles H. Hesser, Harry Richards, R. P. Perkins and N. N. Stokes, who were the offlcials and directors of the Consumers' concern. The plaintiffs in the action recite a series of alleged conspiracies on the part of the defendants to wipe out the competition offered by the Consumers' company to the Wilkes-Barre concern.

IN a communication to the City Council, City Attorney Marvin Schaberg stated that following the expiration of its franchise the Kalamazoo Gas Company could not legally continue in business, using the city's streets. This assertion is in face of an intimation made by the gas company that they contemplate continuing business, whether or not a municipal plant is erected. The city attorney pointed out that decisions of the United States Supreme Court and the statutes of Michigan make it impossible for the gas com-

pany to continue business after the termination of its franchise July 14, 1916. The only possible way in which the company can proceed for another year is that it holds a franchise granted the Kalamazoo Natural Gas and Fuel Company in June, 1887. That franchise was for 30 years, and does not expire until June, 1917.

THE Washington County Gas Company has turned gas on in Johnson City, Tenn. Experts for various stove companies are in the city for a big demonstration. On the day of the demonstration, Mayor S. E. Miller turned on all the lights on the sidewalks on Main street. About three months ago work was begun on the plant, and eighteen miles of mains have been laid.

A NEW ENGLAND paper says: "The sewers of cities are to light the cities. The deadly sewer gas has arisen to the dignity of being useful. It is not illuminating gas, but power gas, and yet it is to light the habitations of men, turn the wheels of engines, and the engines transform it into electricity, and there is the light, just as easy as saying it. The superman of to-day says to the sewers, "Let there be light," and there is light. The inventor of the process shows that the sewer gas from the drain pipes of a city of 10,000 people, will make 150-horse power when properly used; and that means enough to produce all the electricity the place will use for light and household power and heating purposes, at the present rate of such use. He even goes so far as to declare that the sewage from the ordinary country estate of a big family will provide the gas to make power enough to light that place and several others, and furnish power for household work beside."

THE Southern Illinois Light and Power Company, of Hillsboro, and the United Gas and Electric Company, of Litchfield, have filed a joint petition before the Illinois Utilities Commission for approval of the purchase of the Litchfield plant by the Hillsboro company.

PHYSICAL valuation of the public utilities in the District of Columbia will be completed by the Public Utilities Commission early in November, according to present indications. Valuations of the street railway companies are virtually completed, and the commission has started work on the properties of the Potomac Electric Power Company, the Washington Gas Light Company, and the Georgetown Gas Light Company.

JOHN T. BAYLIES who for a number of years was superintendent of the Malden and Melrose (Mass.) Gas Light Company, died last month in Roxbury, Mass., at over 90 years of age.

THE Superintendent of Public Instruction for Polk County, Fla., has been in consultation with Roscoe Nettles, General Manager of the Tampa Gas Company, in regard to the installation of domestic science equipment in the schools of Polk County. Mr. Nettles is very anxious that the domestic science course be included in the curriculum. He backs the addition, not from a business point of view, but because of a conviction that the instruction is necessary in the proper schooling of girls and young women. The introduction of the course in the Polk County schools has been urged by the Tampa Gas Company for some time, although it will be an expense to the company, for the reason that when Lakewood granted it a franchise. a clause was inserted obligating the company to give free of all charge, a domestic science equipment to the schools there. This equipment, Mr. Nettles says, would consist of 12 individual stoves and ovens for each school, with which will be given a water heater and a large cabinet range. By this arrangement the introduction of the course will cost Polk County less than $150 per school for the culinary articles and furniture.

ABOUT 300 employees, and friends, of the New Bedford (Mass.) Gas and Edison Light Company went to Lincoln Park to participate in their annual outing and clambake, the proceeds from which will go to the James Stetson Club. The day's sports began with a ball game between the office employees and the outside men, the latter winning by a 9 to 7 score. The following events made up the athletic programme; 100-yard dash, cable splicing, fat man's race, doughnut eating contest, gas main drilling, running and standing broad jumps, potato race, shot put, three-legged race, pole climbing, pole setting and pipe race. Suitable prizes were awarded the winners. The committee in charge of the arrangements were: James Stetson, Edward Maynard, Patrick O'Brien, Charles Connor and Michael Sylvia. Following the field events an excellent bake was served.

UTILITIES COMMISSION NEWS.

MISSOURI RULES PUBLISHED.—The Missouri Commission has issued General Order No. 20, containing rules regulating gas, electric and water service, effective Oct. 1, 1915. Complete equipment for all tests specified will be maintained at the laboratories of the State University at Columbia, Mo., and the engineering laboratories of the University will be prepared to standardize, for a nominal fee, all testing equipment submitted.

Interest at the rate of 6% per annum, payable annually or upon the return of any deposit, shall be paid by the utility on consumers' deposits, provided they remain for at least six months; the rate of interest to be only 3% if the utility keeps the cash deposit in a separate and distinct trust fund deposited as such in some bank or trust company and not used by the utility in the conduct of its business. Instead of the annual payment of interest on deposits, any other interval between payments agreed to in writing by consumers will be satisfactory to the commission.

All secondary standards, and the working standards of utilities not required to maintain secondary standards, must be submitted at sufficiently frequent intervals to insure unquestionable accuracy to the engineering laboratories of the State University at Columbia, Mo., or the Bureau of Standards at Washington, D. C., or to some testing laboratory of recognized standing for calibration where the utility does not maintain a testing laboratory having primary standards.

THREE VALUES.—In a valuation of the plant of the Springfield (Ills.) Gas Company prepared by A. S. B. Little, an expert in the employ of the State Commission, the valuation of the plant is placed at $734,698, a decrease from the company's figures of more than $200,000. The report prepared by Mr. Little has been filed with the State Public Utility Commission, as a part of the evidence in the pending hearing in which the city is seeking to secure a lower rate for gas. The valuation made by the company's engineers was much higher than that of Mr. Little. The value was estimated by H. C. Anderson at $898,785, while the estimate of J. A. Brown placed a valuation of $940,988 on the entire property.

KANSAS COMMISSION REPORT.—In its second biennial report, covering the period ended Nov. 30, 1914, the Kansas Commission says it regards the existing public utilities law and supplementary legislation as at least reasonably comprehensive and efficient, that some amendments are desirable and even necessary, but that, in the opinion of the commissioners, no attempt should be made to rewrite, re-cast or re-enact the law, as a system. Much better results can be obtained by retention of the law in substantially its present form, and the enactment of amendments demanded by necessity and experience.

The engineering department, in making investigations of the value and necessity of improvements to be bonded, and as to the assets and liabilities of the companies making applications, has been handicapped by the smallness of the force. It is hoped that eventually a complete record of physical property will be established for all utility companies issuing stock and bonds by authority of the commission. The engineering department has been called into consultation by a number of cities on various problems in connection with water, gas and electric utilities, including construction, operation and efficiency. In one case, after examination, an informal opinion was rendered as to what was considered a reasonable price for one of the large private water companies.

CAN'T INSIST ON JOINT POLES.—The up-State New York Public Service Commission has found itself unable to compel the Nassau Light and Power Company to string its wires on the poles of the Glen Cove Light and Power Company in Dosoris Way, Glen Cove, and has dismissed the complaint asking that the company be compelled to take this step The Nassau Company has a contract for street lights in Dosoris Way while the Glen Cove company now has a line of poles there upon which it furnishes electricity to private users. The Nassau company is willing to erect its own poles and furnish the street lights called for in its contract, but will not string its wires on the other company's poles.

"While the commission can readily see how much better it would be for the appearance of the street if there were only one line of poles in the Dosoris Way," says the Commission's order, "yet, under the circumstances, it has no power to compel the Nassau company to abandon any of the rights which it claims under its existing franchise, nor has it any right so far as the record in this case is concerned to compel the Nassau company to put its wires on the poles of the Glen Cove company in Dosoris Way."

Financial Notes.

THE Michigan Utilities Commission has approved the proposed increase in the authorized capital stock of the DETROIT CITY GAS COMPANY from $7,500,000 to $15,000,000. As a result a stock dividend of $1,792,000, being equal to about 27¼%, is being paid to holders of stock of record June 17.

THE combined net earnings available for dividends of the subsidiary companies of the MASSACHUSETTS GAS COMPANIES for July, the first month of current fiscal year, were $200,011, an increase of $12,905, or 6.90%, as compared with the corresponding month a year ago. July earnings compare as follows:

Gas Dept.	1915.	1914
Boston	$84,045	$75,086
East Boston	6,312	13,012
Quincy	5,314	4,010
Newton	8,432	2,644
Total	$104,103	$94,752
Coal Dept.		
N. E. Gas	$37,692	$54,210
N. E. Coal	55,409	26,433
Federal Coal	2,642	7,834
Tow Boat	165	3,876
Total	$95,908	$92,353
Grand total	200,011	187,105

The increase in gas output for July compare with increases for corresponding month last year as follows (in per cent.):

	1915.	1914.
Boston Consolidated Gas Company	*2.04	8.94
East Boston Gas Company	5.09	12.88
Citizens' Gas Light Company	16.60	9.70
Newton and Watertown Gas Company	6.41	11.95

* Decrease.

THE LACLEDE GAS COMPANY has declared a regular quarterly dividend of 1¾% on its common stock, payable Sept. 15.

THE PACIFIC GAS AND ELECTRIC reports income account for the month of July as follows:

	1915.	1914.	Increase.
Total gross op. revenue	$1,482,706	$1,325,579	$157,127
Total expenses	895,161	821,221	73,940
Total net income	622,971	529,101	93,870
Bond interest	269,833	324,264	†54,430
Balance	353,137	204,836	148,300
Other intersst	.....	27,463	†27,463
Balance	353,137	177,373	175,764
Total discount and exp.	13,542	40,315	†26,772
Surplus	339,595	137,058	202,536

Seven months, Jan. 1 to July 31, 1915:

	1915.	1914.	Interest.
Total gross op. revenue	$10,686,204	$9,753,892	$932,412
Total expenses	6,004,504	5,752,674	251,830
Total net income	4,898,996	4,185,638	713,358
Bond interest	2,303,179	2,270,599	32,579
Balance	2,595,817	1,915,039	680,778
Other interest	47,289	209,317	†162,028
Balance	2,548,528	1,705,720	842,807
Total discount and exp.	89,751	266,670	†176,918
Surplus	2,458,776	1,439,050	1,019,725
Dividends:			
First preferred	275,644	.....	275,644
Original preferred	450,000	450,000	.....
Total dividends	725,644	450,000	275,644
Surplus unap'ted	1,733,132	989,050	744,081

† Decrease.

EARNINGS of the UNITED GAS AND IMPROVEMENT COMPANY since July 1 show greater increase than in any single month for a long period. The earnings for the first 7 months of the present year, while higher than the corresponding period last year, were lower than the average. The outlook is encouraging.

THE COLUMBIA GAS AND ELECTRIC COMPANY has purchased for the sinking fund $2,501,500 5% bonds. Funds for this purchase were secured in large part from the cash received in connection with the exchange of its holdings of East Ohio Gas Company shares for 51% of the capital stock of the United Fuel Gas Company. The amount available from this source was $1,750,000.

THE FREEPORT (Ill.) GAS COMPANY has declared a regular quarterly dividend of 1½% on the preferred stock, payable September 1 to stock of record August 24.

IT is said in some quarters that the BROOKLYN UNION GAS COMPANY will consider the question of increasing its capital stock at the directors' meeting scheduled to take place next month. An official of the company stated that he was not aware that any action to this end would be taken by the directors at the forthcoming meeting, although he intimated that developments along this line might crop out at any time. If an increase in the capital is authorized, shareholders will probably be offered the right to subscribe for the new stock pro rata at par. The leading figure in the affairs of this company is William Rockefeller. It will be remembered that in December, 1903, the authorized stock was increased from $15,000,000 to $20,000,000, although the outstanding issue was only raised to $17,999,000. Persons understood to be familiar with the facts in the case claim that the company has acquired considerable property in Brooklyn of late years, and that payment for the same has come out of earnings.

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